What is claimed is:

1. A method of classifying a plurality of elements in images, the method comprising:

forming electronic images of a field of view containing elements, wherein each of the elements has a plurality of features;

extracting and processing a first subgroup of the plurality of features from the images of the plurality of elements to segregate the plurality of elements into first and second groups; and

determining a classification class only for each of the elements in the first group by selecting and processing a second subgroup of the extracted features to determine a physical characteristic of the element, and selecting and processing a third subgroup of the extracted features in response to the determined physical characteristic to determine a classification class of the element,

wherein the second group of elements bypasses the determination of classification class.

2. The method of claim 1, wherein the elements are biological particles that include artifacts and mucus, and wherein the extracting and processing of the first features subgroup segregates the artifacts and the mucus into the second group of elements.

3. The method of claim 1, wherein the elements are biological particles, and wherein the extracting and processing of the first features subgroup further comprises:

segregating any of the elements having a size below a first threshold into the second group of elements as artifacts;

segregating any of the elements having a size above the first threshold and below a second threshold, and having a roundness below a roundness threshold or a darkness relative to a background below a darkness threshold, into the second group of elements as artifacts;

segregating any of the elements having a size above the second threshold, and having a darkness relative to a background below a darkness threshold, into the second group of elements as artifacts; and

segregating any of the elements having a size above the second threshold, and having a roundness greater than a roundness threshold and a darkness relative to a background below a darkness threshold, into the second group of elements as mucus.

4. The method of claim 1, further comprising:

modifying the determined classification class of at least some of the elements of the first group based upon the determined classification class determinations for all the elements in the first group.

5. The method of claim 1, wherein the processings of the second subgroup of the extracted features are performed by a first neural net, and wherein the processings of the third subgroup of the extracted features are each performed by one of a plurality of neural nets.

6. The method of claim 5, wherein for each of the elements in the first group:

the first neural net dictates which one of the plurality of neural nets processes the third subgroup of the extracted features.

7. The method of claim 6, wherein:

the second subgroup of the extracted features includes: element roundness and element size; and

the third subgroup of the extracted features includes: element size.

8. The method of claim 7, wherein:

the second subgroup of the extracted features further includes: an elongation ratio.

9. The method of claim 7, wherein:

the second subgroup of the extracted features further includes: element contrast against an element background.

10. The method of claim 7, wherein:

the second subgroup of the extracted features further includes: an element gray level distribution.

11. The method of claim 1, further comprising:

segregating the first group of elements into a third group of the elements having a size below a predetermined size threshold, and into a fourth group of the elements having a size above the predetermined size threshold, and wherein the determining of the classification class is performed using a first network of neural nets for the third group of the elements and using a second network of neural nets different from the first network of neural nets for the fourth group of the elements.

12. The method of claim 1, wherein the physical characteristic is a predetermined amount of element elongation, and for each of the elements in the first group, the determined classification class is selected from one or more groups comprising bacteria, yeast, red blood cells, white blood cells, and crystals.

13. The method of claim 1, wherein the physical characteristic is a predetermined amount of contrast, and the determined classification class is selected from one or more groups comprising HYAL, MUCS, SPRM, NHC and SQEP.

14. The method of claim 1, wherein each of the electronic images is formed of rows and columns of original pixels each having a pixel value, and wherein the forming of each one of the electronic images further comprises:

inserting rows and columns of new pixels among the rows and columns of the original pixels; and

giving a pixel value to each of the new pixels based upon the pixel values of the original pixels in proximity therewith.

15. The method of claim 1, wherein each of the determinations includes assigning a probability factor, and further including modifying the determined classification class to an artifact classification in the event one or more of the probability factors used to classify the element fails to exceed a predetermined threshold value.

16. An apparatus for classifying a plurality of elements in images, the method comprising:

an imaging system for forming electronic images of a field of view containing elements, wherein each of the elements has a plurality of features;

at least one processor for:

extracting and processing a first subgroup of the plurality of features from the images of the plurality of elements to segregate the plurality of elements into first and second groups; and

determining a classification class only for each of the elements in the first group by selecting and processing a second subgroup of the extracted features to determine a physical characteristic of the element, and selecting and processing a third subgroup of the extracted features in response to the determined physical characteristic to determine a classification class of the element,

wherein the second group of elements bypasses the determination of classification class.

17. The apparatus of claim 16, wherein the elements are biological particles that include artifacts and mucus, and wherein the extracting and processing of the first features subgroup by the at least one processor segregates the artifacts and the mucus into the second group of elements.

18. The apparatus of claim 16, wherein the elements are biological particles, and wherein the extracting and processing of the first features subgroup by the at least one processor further comprises:

segregating any of the elements having a size below a first threshold into the second group of elements as artifacts;

segregating any of the elements having a size above the first threshold and below a second threshold, and having a roundness below a roundness threshold or a darkness relative to a background below a darkness threshold, into the second group of elements as artifacts;

segregating any of the elements having a size above the second threshold, and having a darkness relative to a background below a darkness threshold, into the second group of elements as artifacts; and

segregating any of the elements having a size above the second threshold, and having a roundness greater than a roundness threshold and a darkness relative to a background below a darkness threshold, into the second group of elements as mucus.

19. The apparatus of claim 16, wherein the at least one processor modifies the determined classification class of at least some of the elements of the first group based upon the determined classification class determinations for all the elements in the first group.

20. The apparatus of claim 16, wherein the at least one processor utilizes a first neural net for the processings of the second subgroup of the extracted features, and utilizes one of a plurality of neural nets for each of the processings of the third subgroup of the extracted features.

21. The apparatus of claim 20, wherein for each of the elements in the first group:

the first neural net dictates which one of the plurality of neural nets is utilized to process the third subgroup of the extracted features.

22. The apparatus of claim 21, wherein:

the second subgroup of the extracted features includes: element roundness and element size; and

the third subgroup of the extracted features includes: element size.

23. The apparatus of claim 22, wherein:

the second subgroup of the extracted features further includes: an elongation ratio.

24. The apparatus of claim 22, wherein:

the second subgroup of the extracted features further includes: element contrast against an element background.

25. The apparatus of claim 22, wherein:

the second subgroup of the extracted features further includes: an element gray level distribution.

26. The apparatus of claim 16, wherein the at least one processor segregates the first group of elements into a third group of the elements having a size below a predetermined size threshold, and into a fourth group of the elements having a size above the predetermined size threshold, and wherein the at least one processor determines the classification class by utilizing a first network of neural nets for the third group of the elements and using a second network of neural nets different from the first network of neural nets for the fourth group of the elements.

27. The apparatus of claim 16, wherein the physical characteristic is a predetermined amount of element elongation, and for each of the elements in the first group, the determined classification class is selected by the at least one processor from one or more groups comprising bacteria, yeast, red blood cells, white blood cells, and crystals.

28. The apparatus of claim 16, wherein the physical characteristic is a predetermined amount of contrast, and the determined classification class is selected by the at least one processor from one or more groups comprising HYAL, MUCS, SPRM, NHC and SQEP.

29. The apparatus of claim 16, wherein each of the electronic images is formed of rows and columns of original pixels each having a pixel value, and wherein the at least one processor inserts rows and columns of new pixels among the rows and columns of the original pixels, and gives a pixel value to each of the new pixels based upon the pixel values of the original pixels in proximity therewith.

30. The apparatus of claim 16, wherein each of the determinations by the at least one processor includes assigning a probability factor, and wherein the at least one processor modifies the determined classification class to an artifact classification in the event one or more of the probability factors used to classify the element fails to exceed a predetermined threshold value.